THE NEVADA-DOUGLAS MINE

Nevada's Great Copper Property That Is Making History for Yerington

To the layman who has not been fortunate enough to visit a large copper mine, and see huge deposits of high-grade copper ore, the Nevada Douglas would be a seven days' wonder. Imagine a sulphide ore body 500 feet long, over 57 feet wide, developed by an upraise for 25 feet, and on the level 100 feet deeper, and you have a fair idea of the extent of this great property.

The Nevada Douglas company owns the Ludwig and Douglas groups, which comprise about 700 acres of richly mineralized territory.

Two years or more ago Walter C. Orem proceeded to Yerington from Salt Lake for the purpose of establishing the truth or falsity of the reports from that camp. The result of Mr. Orem's investigations was the purchase of the Douglas properties, which, from the early days, had been counted as the nucleus of an extremely valuable mine. Mr. Orem and associates of Salt Lake City and the east formed the Nevada Douglas company, and work was started to develop the territory at depth without delay.

Not many months ago the Ludwig group, which adjoined the Douglas, was secured by the Nevada Douglas company, a purchase that rounded out the original group in an ideal way geographically, while the Ludwig workings at depth had gone far toward establishing that Yerington ore bodies extend to depths with greater richness than was in evidence on the upper levels. By concentrating effort on the lower levels of the Ludwig, the Nevada Douglas company has opened a great mine, it has discovered the key to the entire territory within its lines, and it has shown the world that Yerington is one of the great red metal districts of the west.

Ludwig Geology.

Geologically the Nevada Douglas properties may be stated to be characteristic of the Yerington camp. At the end of the Ludwig outcrop is an immense granite porphyry dike, the Ludwig outcrop consisting of white lime in contact with this dike, which eventually merges into a gossan capping. This gossan extends through the Ludwig outcrop its entire length, varying in width on the surface from twenty to fifty feet, in one place being 100 feet in width.

The ore bodies, as disclosed underground, consist of carbonates or oxidized ores extending to a depth of 550 feet, where the sulphides begin, the upper portion being partially enriched by secondary enrichment. On the 550-foot level the sulphide ores are disclosed for 500 feet in length by more than fifty feet in width, with the sulphides extending to the face of the south drift. The ore bodies are proved to a depth of 50 feet and more below the 550-foot level by two winzes. One is 50 feet in depth, the other is 60 feet deep, and the same body is now had on the 650-foot level, an upraise has been sent into the ore for 25 feet, and four cross-cuts have established the following widths: Eighty feet, 100 feet, 20 feet and 30 feet, with all four still in ore. The ore bodies promise to be more deeply developed soon by drifts and cross-cuts now under way on the 650-foot level. The ore averages 6½ per cent copper.

The strike of the ore bodies is south, with a strong dip to the eastward, indicating that the sulphide ore bodies, with depth, will approach and enter in the Douglas properties.

Ludwig's Great Showing.

The showing on the 550-foot level of the Ludwig can hardly be fittingly described. The contrast of the occasional bunches of beautiful malachite and azurite ores with the black and heavy chalcocite and bornite resources is striking, and when one considers the width and length of this splendid ore body, and its average copper value, being richer and stronger just because it is closer to the permanent mineral zone, he is brought face to face with the fact that he is inspecting the mere index to the metal wealth of this mine. A depth of 550 feet is not great considering the distance yet to be probed, yet it is deep enough to show to the satisfaction of everyone that the ores, the deeper the management goes, get better in size and richer in value. And better still, the ores demand no preliminary treatment to make them amenable to the smelting process. The ore of the sulphide zone is self-fluxing, containing sufficient fluxing qualities to allow their mixture with the enormous carbonate deposits closer to the surface.

When one sees the 550-foot level, and the winzes sent from the same, he ceases to wonder that the Nevada Douglas company can ship hundreds of tons of 18 to 20 per cent copper rock, the result of nothing but pure development work. Yet the secret of the ultimate success of this organization lies in the installation of its own smelting plant. This is a matter of time, and short time at that.

The management is now engaged in sinking a winze from a point close to the face of the south 550-foot level drift. This winze is bound for the 650-foot level, and the entire bottom of this working averaged 16.5 per cent copper. On the other or north end, and at a point fully 400 feet from this winze, the management is driving an upraise. This is up now about fifty feet, and at the time of making the report the face averaged 25 per cent copper, averaging 10.98 per cent copper at the first of this week.

On the same vein of ore on the 650-foot level, the management has sent a cross-cut into ore for over fifty-five feet, and has drifted on the same for over forty feet, the ore maintaining its average value of 6 per cent, being a copper-iron sulphide of ideal fluxing qualities. Mr. Orem states that the two drifts on the 650-foot level, although 100 feet apart, are considered by the management as working in one and the same ore body, as there is every indication that soon the calcite separating the two drifts will be replaced by the characteristic copper sulphides now had in so many places in this property. It should be added that this fifty-five-foot cross-cut has its face still in ore, and the foot wall has not yet been encountered.

Douglas Group Geology.

On the Douglas group the ore bodies extend northeast to southwest on the strike, and are intersected by a granite porphyry dike 100 to 150 feet in width, the dyke dipping on an angle of 45 degrees southwestwardly. In contact with the porphyry dike superficial openings and outcrops disclose a parallel gossan outcrop on the hanging wall of the mineral zone. Strong mineralization is shown in the gossan of the outcrop, penetrated at intervals by shafts along the strike of the gossan outcrop extending northeastwardly to the summit or apex of one of the hills, and to the main summit or apex of Douglas mountain.

On the southeast part of Douglas mountain, and on the foot wall side of the granite porphyry dike, another strong zone of mineralization is shown by shallow shafts and excavations, and in that vicinity the dike is the hanging wall of the mineralized zone. Extending northeastwardly from the apex of the mountain a large body of ore is developed by shafts and tunnels driven from the east side of the mountain through lime into the ore body.

The ore body is opened by cross-cuts, a high stope and a winze, the latter being eighty-five feet below the tunnel level. The winze extends down to the porphyry dike which constitutes the foot wall of the mineralized zone. This ore body dips to the southeast, and promises to develop into a body of large magnitude. The ore is deceptive to one not familiar with it. On first glance it resembles closely granite, but it is a porphyry thoroughly impregnated with copper sulphides running as high as 18 per cent copper, and is the only ore of this peculiar character that has come within the range of many a visiting mining engineer. The high stope is a picture gallery of values, and is one of the most interesting points in the property.

The southeast side of the mountain is composed of lime and granite lime, and is intersected by parallel fissures which are superficially developed and disclosed strong mineralization. On the southwest side of the Douglas properties a large body of blue lime forms the apex of the highest mountain on that side, the blue lime contacting with granite lime. This contact discloses good mineralization nearly to the summit of the mountain. The lower portion of the territory, east of the compressor building, is intercepted by mineralized fissures extending parallel to the Ludwig gossan strike.

Big Gypsum Deposits.

The west side of the property, beyond the Ludwig and the Douglas workings, contains large deposits of high-grade gypsum, being exceptionally large to the north end of the property, and located west of the north end of the Ludwig.

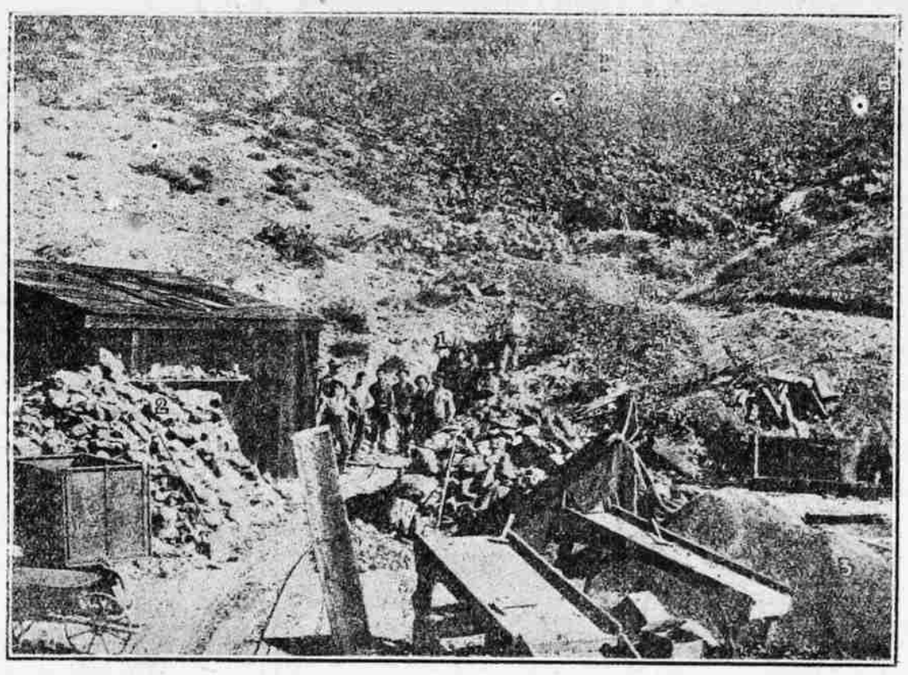
On the 400-foot level of the Ludwig the limestone zone is 100 feet wide, carbonate ore occurring in the same to a width of 30 feet. One stope from this level shows 20 feet of ore. The upper levels have not been explored, the management expending all energy on getting into the sulphide ores at depth. The 650-foot level is disclosing ores at this time, but the logical point for the big ore body has not been gained.

Mine Finely Equipped.

In every way the Nevada Douglas company is magnificently equipped for work. The mine is on the line of the Truckee power company, and the machinery is electrically driven, the mine electrically lighted. In case of emergency the complete steam plant can be utilized at a few hours' notice. The company owns three huge springs of water, from one of which sufficient water now is had for all purposes round the works. When the enterprise reaches its logical dimensions, the company can so improve its water supply that more than enough will be had for smelting and all other purposes.

One item that adds greatly to the pleasure of inspecting this property is the fact that each five feet through out the mine is tagged and numbered, to correspond with which the management furnishes a list of assays which disclose the value of each particular block at a glance. Wonderful progress has been made in the Ludwig since the present owners took charge, and no time has been lost in bringing out results. General Manager Walter C. Orem is ably assisted in the management of the Nevada Douglas properties by Superintendent S. A. Arentz, who brings to bear on his work an intelligent conception of the task before him and a long experience in mining operations. The accommodations for the men employed are all that could be desired, a great deal better than one would expect in a desert region where the comforts of life are hard to secure.

The Nevada Douglas is attractive, first, because it has an enormous tonnage of ore blocked out; second, this ore is self-fluxing, and third, there is a vast amount of its territory equally as rich, but unprospected at depth, as that portion now under development.



DOUGLAS HILL.

Of the Nevada Douglas Copper Mining Company—Entire Photograph Represents Exposures of Copper Ore. (1)—Miller Tunnel. (2)—Ore for Shipment, Average 13 Per cent Copper. (3)—Screenings, 8 Per Cent. (4)—20 Feet Wide, 7.22 Per Cent Copper. From A to B 300 Feet, General Average 6-Inch Trench 2 Per Cent Copper.

Yerington an Old Camp.

To the average outsider Yerington as a copper camp is one of the discoveries of the Resurrection Period of Nevada mining. Few if any readers can carry their recollections of the district farther back than four years. Yet in the days of "Pizen Switch's" glory, when all Nevada was being gone over by the prospector with a fine-toothed comb for silver-bearing rock, several Yerington groups were sending to Dayton, the county seat, heavily loaded bull-teams, carrying high-grade copper ores for the market. Nor has the camp been entirely idle during the sleeping period. For years the owners of Yerington mines have worked in a desultory way, protecting their interests until the boom in copper a couple of years ago placed a greater value on their holdings.

It is only as a modern district, one being developed by some of the strongest and most efficient capital in the land, that Yerington can lay claim to novelty. As was often the case in early mining, the operators were limited as to market, only the richest rock the property was capable of producing being sufficiently profit-breeding to allow shipment. So the surface of Yerington mines was thoroughly gophered in the early days, the ores now considered high-grade with modern metallurgical methods were not touched in those days.

But Yerington no longer pays attention to the surface, it no longer confines its attention to seeking rich pockets of rock close to grass roots. It does not consider a mere tickling of mountain sides an efficient way of bringing resources to daylight. They are looking for sulphides at depth, and best of all, they are finding them in a manner entirely in keeping with early expectations.

Up to date there are just two great copper camps in Nevada. One is Ely, the other is Yerington. By virtue of its greater development, Ely now is in the lead, and it has its own railroad line and smelting plant. But Yerington deposits uniformly carry better copper values than the ores of the great Ely monzonite belt, and in time Yerington will have a railroad and two or more smelters. It will be an interesting race then for the supremacy, a race that will redound to the everlasting benefit of stockholders in both camps.

Rich Valley Land.

Bordering the Mason valley on the west is a range of mountains holding the mines which comprise what the world knows as the Yerington district. To the west of this range lies Smith valley. The two valleys show the effects of before and after application of bounteous water. Mason valley is a green, fertile and inviting stretch of country, within whose confines are groves of trees sheltering ranch homes and farm lands that appear out of place in arid Nevada. Its ranches produce hay, grain, vegetables and cattle that are unsurpassed anywhere, while fruit left entirely to its own resources, barring occasional late frosts, matures splendidly. One rancher markets each year twenty tons of honey, taking the first prize for this product at the Chicago World's fair, while Mason valley potatoes are in demand at San Francisco.

Yet as bountifully as this valley is provided, and as richly productive as it now is, it is as nothing in comparison with what it will be when the government or some private enterprise steps in and distributes the water, now wasted and poorly distributed, according to modern scientific irrigation principles. Smith valley, with a few exceptions toward its far western rim, still is a desert, awaiting irrigation to make of it what Mason valley now is.

The agricultural interests of this section are worthy of the prominence given them, for they provide, independently of the extensive mining interests surrounding them, a powerful argument for the extension of the Southern Pacific railroad line from Wabuska. The ranches likewise make mining nearby a more pleasant and economical matter than is usually met with in desert mining, and they indicate the presence of a limitless supply of water for all purposes, both in mining and farming.

Railroad Is Logical.

A railroad is certain to reach Yerington mines within the next few months; the farming needs demand it. Under cultivation in the Mason, Smith, Antelope and the upper East Walker valleys are 100,000 acres of land. In the year 1907, in less than carload lots, there were shipped from these valleys 456,250 pounds of freight, while 9,911,230 pounds were received from the railroad for these valleys. During the same year, in carload lots, there were 59,226,910 pounds received, and 8,924,980 pounds of freight shipped out. This does not take into consideration the number of passengers that are carried in and out of the district a year, nor the increase of agricultural products with a wider application of irrigation.

Over a year ago it was estimated by a competent mining engineer that there were fully 25,000,000 tons of ore blocked out in the mines of the camp, of which 15,000,000 tons were of shipping grade. And this tonnage has been increased enormously by the deep development work done since.

And railroad building to the mines would be little more than a mere track laying proposition, while the grades are such as will delight the heart of a railroad builder. The logical road for the mines would divide a short distance east of Mason Pass, one passing along the east side of the range, the other through Mason Pass along the west slope of the range to the Nevada Douglas property.

How to Get There.

The mines of Yerington are reached via Wabuska, the nearest railroad point on the Southern Pacific branch line from Hazen to Goldfield. From Wabuska stage and automobile lines carry passengers to whatever point be their destination. The Nevada Douglas and the western end of the camp are reached by crossing the range at Mason Pass and proceeding down Smith valley for a few miles.

Mining conditions in Yerington are all that could be desired for efficient work. The presence of abundant water is not characteristic of Nevada camps, and the surrounding rich farming country is a welcome contrast to what one usually meets with in the Sage-brush state. And where the mines of the district have a tremendous advantage is in the electric power line that provides more than sufficient power to satisfy the most exacting.

The Truckee Power company furnishes a minimum power service to any one company of 100 horse-power at $1 per horse-power a month. All power used in excess of this minimum is paid for at the rate of 1¾ cents per kilowatt. The long coal haul from Wabuska would make steam power extremely expensive, and coal costs money under favorable conditions in that state.

The massive, solid formations prevailing throughout the camp solve the timber question, for practically no timbering is required anywhere. This makes slower work in pushing drifts and tunnels into the hills, but when the day comes for Yerington to produce on a gigantic scale the caving system only will be employed. Then solid formations will count in cheap extraction of ores.

Yerington is a camp of economical mining on a gigantic scale. There is not a district in the country that can surpass it for cheapness of smelting owing to the character of its ores, were it not for the cost of fuel. But with a railroad, there is every reason to believe the district's smelting expense will be kept down to within seeing distance of the cheapest smelting camp of the land.

LARGE PROJECT IS MAKING HEADWAY IN WEBER CANYON

J. P. O'Neill Construction Company of Ogden Has Contract for Large Power Plant.

The Utah Light and Railway company, back of which is E. H. Harriman, has under way the construction at Devil's Slide, in Weber canyon, an immense power plant that calls for the expenditure of $360,000.

The electrical output from this plant is to be generated by water diverted from the Weber river at a point about one-half mile west of Gateway, which is the new name for Devil's Slide. This water is diverted by means of a heavy concrete dam, fourteen feet in height and 100 feet in length, with ten five-foot wicket gates for relief of the pressure during high water. After being diverted, the water is carried in a westerly direction along the south side of the Weber river. It is carried on this course through a concrete pipe, 8 feet 4 inches in diameter and eight inches thick, with strong steel reinforcement. Under pressure of ninety pounds per square inch, the water is carried for 2000 lineal feet to the junction with a continuous wooden stave pipe, 7 feet 4 inches in diameter.

This wooden stave pipe runs westward for 7000 feet to the big power house. On a steel bridge of 100-foot spans this big pipe crosses the river. The pipe will be under the maximum head of 180 feet, with a capacity of 350 cubic feet of water per second. This pipe will discharge its heavy waters, taken from the Weber river above, into a 35,000-horsepower turbine, which will generate the electricity for railroad and commercial purposes.

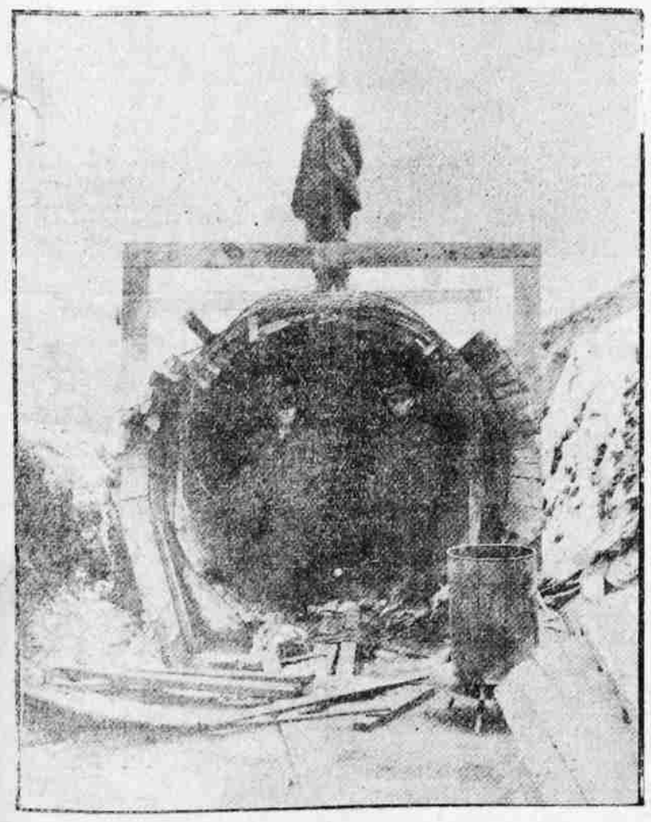
It was to the progressive J. P. O'Neill Construction company of Ogden that the large contract was let for the mammoth concrete retaining wall, to cover a distance of 1000 feet, the giant concrete pipe, the reinforced dam; including the big task of excavating for the entire pipe line, which will total about 55,000 cubic yards. The amount of concrete to be used by the O'Neill company will total over 3500 yards.

This extensive contract is under the direct supervision of Mr. J. P. O'Neill, manager of the company, who exercises jealous care of every little detail. Under his able management this concern has grown to be one of the largest contracting firms in the entire West.

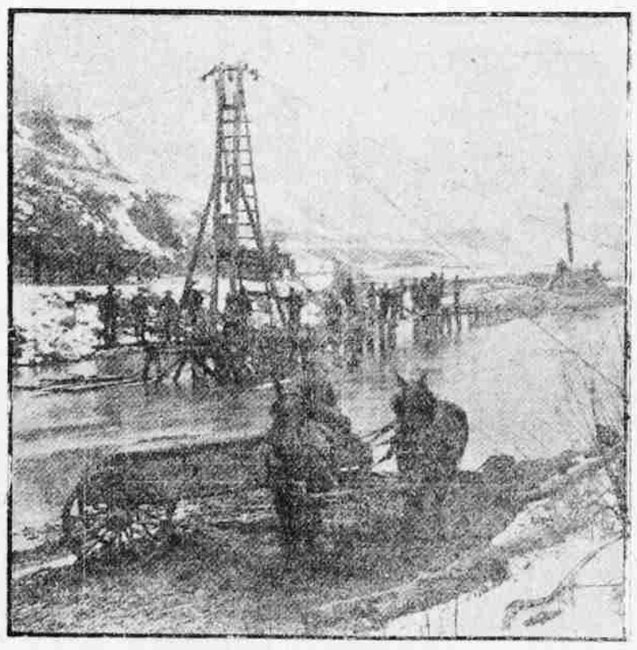
In addition to its numerous big contracts, such as the present mammoth undertaking, the J. P. O'Neill company has done almost all of the cement work in the city of Ogden. Sidewalks, curbs and gutters, of which there are many miles in this city, have been built of cement by the O'Neill company.

From the beginning, this Ogden firm's work has been satisfactory, both as to cost and as to results. In addition to the curbing, guttering and sidewalking, of which the O'Neill company has built six miles in Ogden, they finished the asphaltum paving on Washington avenue, which is regarded as the best work in America in the judgment of the most competent engineers in the country, who have gone over the contract as completed by the O'Neill company.

The company has just completed eighty blocks of cement sidewalks in Salt Lake City, this work being done during the summer. It has also completed work in various towns and cities all over the entire state.



VIEW SHOWING SIZE OF PIPE.



WHERE PIPE LINE CROSSES RIVER.

ROBERT FORRESTER.

It seldom falls to the lot of one man to be so signally honored as has been the case with Utah's most noted mining engineer and geologist, who is the subject of this sketch.

It was indeed an honor not to be lightly esteemed when Robert Forrester was called from Washington and New York, where his business called him, to take charge of a party of foreign scientists, consisting of Victor Watteyne, inspector general of mines of Belgium; Carl Meissner, councillor of mines for Germany; Capt. Arthur Desborough, H. M. inspector of explosives, England, and Dr. Joseph H. Holmes, chief of technological department, United States geographical survey, who were on an expedition of inquiry concerning the methods used in the mining industry of this country. This party, under the direction of Mr. Forrester, traveled in a private car throughout the States of Utah and Colorado and made an exhaustive study of the various mining conditions of those states. It may be said to the credit of Utah and her scientific mine managers that all of their recommendations have been in the protection of life and property for the past eighteen years. A number of these features were made note of by these men for installation in the European mines, and they were a unit in saying that the methods of Utah mines were greatly in advance of those in European countries.

Born in Scotland and educated at the University of Edinburgh, it was only natural that his mind should have a a scientific turn and he soon turned his training to practical account after leaving college. West Calder was his first field of experience from which country he came to America and chose Pennsylvania as his first scene of operations. From there he went to Missouri, Kansas and later came to Utah. Mr. Forrester has had many positions of great responsibility since coming to Utah and many of the largest coal mines of the state were opened up under his supervision and upon his advice. The Utah Fuel company has availed themselves largely of the services of Mr. Forrester and their Castle Gate mines in Carbon county were under his charge for quite a while. The Diamond Coal and Coke company, of Diamondville, Wyoming, engaged his services in opening up that property for them. He also opened the Morrison mine for the Sterling Coal and Coke company.

His busy business career did not interfere with his offering his services to his adopted country when the war with Spain broke out, for he enlisted in the Second United States Volunteer Cavalry, in which he served his time.

Busy man that he is, Mr. Forrester has found time to cultivate the sports and he is an enthusiastic huntsman and fisherman. Club life also claims part of his time and he holds memberships in the following: The Denver Athletic club, and the Alta and Commercial clubs of Salt Lake City, besides the following scientific bodies: The American Association for the Advancement of Science, the Forestry Association of America, the National Geographical society, the Colorado Scientific society, the American Institute of Mining Engineers of the United States and the Geological Society of Edinburgh, Mining and Metallurgical Society of America.

Although his services are in demand from Canada to Mexico, Mr. Forrester makes his home in Salt Lake City and maintains a large suite of offices in the Brooks Arcade, where he is surrounded by his extensive library and able corps of assistants.

"I suppose you visited some of the finest collections in Europe?"

"Yes," answered Mr. Cumrox, "and I never before appreciated the full significance of that frequent remark, 'collections are slow'."—Washington Star.

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